

Claims

1. A multiple coupling lock (120, 120') for the locking in an essentially environmentally sealed manner of and/or for the filling and/or refilling in an essentially environmentally sealed manner of bulk materials from flexible and/or rigid containers or means of conveyance (102, 102'), in particular hose sections, comprising at least two coupling locks (101, 101'; (110, 110'), which are in each case connected with each other, or can be connected with each other in particular in an environmentally sealed manner, via a means of conveyance which is at least flexible and/or rigid in sections, in particular a hose, the opening area, in particular the inner diameter, of an opened, first coupling lock, also known as the outer coupling lock, being larger than the area of the outer circumference and/or opening, in particular the outer and/or inner diameter, of a second coupling lock (102, 102'), it being possible to dock the second coupling lock (110), in particular in an environmentally sealed manner, and when the first coupling lock (101) is open, to a corresponding coupling lock (110'), which is located within the means of conveyance (102, 102'), and/or which permeates through the opening of the first coupling lock (101) at least in sections, thus forming a docking device.
2. A multiple coupling lock (120, 120') according to claim 2, characterised in that a third coupling lock is connected, or can be connected, to the second coupling lock, in particular in an environmentally sealed manner, the opening area, in particular the inner diameter, of the opened, second coupling lock being larger than the outer circumference and/or opening area, in particular and outer and/or inner diameter, of the third coupling lock, it being possible to dock the third coupling lock when the second coupling lock is open to a corresponding coupling lock within the first and/or second means of conveyance, and/or at least in sections for it to penetrate through the opening of the second coupling lock, in particular in an environmentally sealed manner, to form a docking device.
3. A multiple coupling lock (120, 120') according to claim 1 or 2, characterised in that at least one, in particular a first, coupling lock (101, 101') which comprises at least a first, flexible band (2) with at least one, in particular continuous, locking element (10), in particular a clip, on its inner side (6) and at least one

flexible band (4) with at least one second, in particular continuous, locking element (12) on its inner side (8), which is complementary to the first locking element (10), and which enables reversible, tight closure with this, in particular a groove, the first and second band (2, 4) and/or the first and second locking element (10, 12) being in particular essentially of the same length, the first and second band (2, 4), in particular via each of their end sections, being connected with each other, in particular forming a closed circumference, and the upper side (14) of the first band (2) having at least a third, in particular continuous, locking element (18) and/or the upper side (16) of the second band (4) having at least a fourth, particularly continuous, locking element (20).

4. A multiple coupling lock (120, 120') according to claim 3, characterised in that the coupling lock comprises at least a fifth and/or sixth locking element on at least one outer side of the first and/or second band.
5. A multiple coupling lock (120, 120') according to claim 3 or 4, characterised in that the coupling lock comprises a locking lid (30), containing at least a seventh and/or eighth locking element (32, 33) which is/are complementary to the third and/or fourth locking elements (18, 20) of the upper sides (14, 16) of the first and second band (2, 4), it being possible to connect the seventh and eighth locking elements (32, 33) to the third and/or fourth locking elements (18, 20) to form a temporary cover for the connection slit (34) of the first and second band, when the inner sides (6, 8) of the first and second band (2, 4) are connected with each other via a reciprocal reaction between the first and the second locking element (10, 12).
6. A multiple coupling lock (120, 120') according to claim 5, characterised in that the locking lid (30) is connected with the first or second band (2, 4), in particular as a single piece, and in particular using at least one film hinge (28).
7. A multiple coupling lock according to claim 5 or 6, characterised in that the locking lid (30) comprises at least one operating handle (42).
8. A multiple coupling lock according to claim 3 to 7, characterised in that the first and/or the second band (2, 4) comprises/comprise at least one operating handle, in particular on the outer side (22, 23).
9. A multiple coupling lock according to one of claims 3 to 8, characterised in that the coupling lock (101, 101') of this type already comprises a flexible bag (38,

- 40), or hose, the opening edge (26) of which is connected with the first and second band (2, 4) either separately or as a single piece.
10. A multiple coupling lock according to one of claims 3 to 9, characterised in that at least the inner side (6, 8) and/or the outer side (14, 16) of the first and/or the second band (2, 4) comprises/comprise a bonding and/or adhesive layer, at least in some sections.
 11. A multiple coupling lock according to one of claims 1 or 2, characterised in that at least one, in particular a first coupling lock (101, 101') comprises essentially rigid frame bands (52, 54) and join elements (56), whereby immediately adjacent frame bands are connected with each other to form a folding frame (58), so that the inner sides (60, 62) of adjacent and/or opposite frame bands can be folded one on top of the other to form a lock, which is in particular environmentally sealed.
 12. A multiple coupling lock according to claim 11, characterised in that the folding frame (58) comprises x frame bands (52, 54) and x join elements (56), whereby in particular, $x = 2n$, and n is an integer number higher than or the same as 2.
 13. A multiple coupling lock according to one of claims 11 or 12, characterised in that the join elements (56) are hinges, film hinges and/or elastic materials.
 14. A multiple coupling lock according to one of claims 11 to 13, characterised in that at least one, in particular a first coupling lock (50') comprises a folding frame, comprising six frame bands (152, 154, 184, 186, 188, 190) and six join elements (176, 178, 180, 182, 196, 198), with a first pair (192) of adjacent frame bands (184, 186) which are connected via a join element (196) and which are in particular essentially of the same length, together with a second pair of adjacent frame bands (188, 190) which are connected via a join element (198) and which are in particular essentially of the same length, and with a third pair (156) of non-adjacent frame bands (152, 154) and/or which are not directly connected via a join element, in particular essentially of the same length, the total of the length of one frame band (184, 186) from the first pair (192) and the length of one frame band (186, 188) from the second pair (194) not being higher than the length of one frame band from the third pair (156) of frame bands.

15. A multiple coupling lock according to claim 14, characterised in that the inner side of the first frame band (184) of the first pair (192) and the inner side of the first frame band (186) of the second pair (194) can both be turned towards the inner side of the first frame band (152) of the third pair (156), and the inner side of the second frame band (186) of the first pair and the inner side of the second frame band (190) of the second pair (194) can both be turned towards the inner side of the second frame band (154) of the third pair (156) to form a sealed locking slit.
16. A multiple coupling lock according to one of claims 11 to 15, characterised in that the folding frame (58) comprises a sealing lip (200) in the area of at least one of its surrounding edges, which essentially encompasses it, and which extends inwards and/or over the edge.
17. A multiple coupling lock according to one of claims 14 to 16, characterised in that at least one spacer (212, 214, 216, 218) on the outer side of the first and/or the second frame band (184, 186, 188, 190) of the first and/or the second pair of frame bands (192, 194), which are positioned closer to the shared join element(s) (176, 178, 180, 182) with the frame band(s) (152, 154) of the third pair of frame bands (156) than to the join element(s) (196, 198) which connect the frame bands of the same pair of frame bands.
18. A multiple coupling lock according to one of claims 11 to 17, characterised in that the inner sides (60, 62), at least in sections, comprise first and second locking rails (64, 66) which are in particular complementary and/or made of elastomer or springy elastic material for environmentally sealed locking, the total length of the first locking rail (64) essentially corresponding to the total length of the second locking rail (66), and the first and second locking rails or their sections being arranged on the inner sides of the frame bands in such a manner that they form an environmentally sealed locking slit when the frame bands (52, 54) are folded one on top of the other, in particular interlocking in such a manner that they are aligned with each other.
19. A multiple coupling lock according to one of claims 11 to 18, characterised in that first and/or second locking rails (64, 66) extend to the inner sides of join elements (56) and/or are positioned on these, or can be attached to them.

20. A multiple coupling lock according to claim 18 or 19, characterised in that the first locking rail (64) is a groove and the second locking rail (66) is a clip which is complementary to the groove.
21. A multiple coupling lock according to one of claims 18 to 20, characterised in that at least one first locking rail is positioned at least in sections on the inner side of adjacent first and second frame bands, and at least a second locking rail is positioned at least in sections on the inner sides of adjacent third and fourth frame bands.
22. A multiple coupling lock according to one of claims 11 to 21, characterised in that the coupling lock comprises at least two operating handles, which in particular are positioned on, or can be attached to, non-adjacent frame bands.
23. A multiple coupling lock according to claim 22, characterised in that at least one operating handle (162, 164) has at least one centring and/or clamping unit (166, 168; 172, 174) for interaction with the corresponding coupling lock, in particular its centring and/or clamping unit, to form a docking device.
24. A multiple coupling lock according to one of claims 11 to 23, characterised in that at least one folding frame is made of a single piece.
25. A multiple coupling lock according to one of claims 11 to 24, characterised in that at least one, in particular all frame bands (52, 54) on the upper side (69, 70) comprise at least one locking element (72), which is in particular made of elastomer or resilient material, at least in sections.
26. A multiple coupling lock according to claim 25, characterised in that at least the first locking element (72) is a groove and/or a spring which is in particular continuous.
27. A multiple coupling lock according to one of claims 11 to 26, characterised in that the coupling lock comprises at least one second locking element (74) on the outer side of at least one frame band (52, 54).
28. A multiple coupling lock according to one of claims 11 to 27, characterised in that the coupling lock comprises at least one locking lid (80) with at least a third locking element, which is essentially complementary to the first locking element and/or at least a fourth locking element which is essentially complementary to the second locking element, so that the locking lid covers the locking slit of the folding frame, at least in sections, when the coupling lock is closed.

29. A multiple coupling lock according to claim 28, characterised in that the locking lid is connected, at least in sections, with a frame band via a hinge, a film hinge or a flexible connecting element.
30. A multiple coupling lock according to claim 28 or 29, characterised in that the locking lid is fitted with at least one operating and/or transportation handle.
31. A multiple coupling lock according to one of claims 11 to 30, characterised in that the coupling lock comprises a flexible container or a flexible hose or a flexible hose element, which is connected in a sealed manner with the frame bands (52, 54) and/or the join elements (56).
32. A multiple coupling lock according to one of claims 11 to 31, characterised in that at least the inner side (60, 62) and/or the upper side (68, 70) of at least one frame band (52, 54) comprise a bonding and/or adhesive layer, at least in sections.
33. A multiple coupling lock according to one of claims 11 to 32, characterised in that the coupling lock comprises at least one first clamping element (76) on the inner side (60, 62) of at least one frame band (52, 54), and at least one first clamping opening (78) or first latching element in one inner side of at least one frame band, it being possible to latch the first clamping element into the first clamping opening, in particular in a reversible manner, when the folding frame (58) is closed.
34. A multiple coupling lock according to one of claims 14 to 33, characterised in that the first and second frame bands (152, 154) of the third pair (156) of frame bands, in particular on their inner sides, comprise in each case at least one clamping device (210, 210') which correspond to each other for reversibly connecting these frame bands when the coupling lock is in a closed state.
35. A multiple coupling lock according to one of claims 14 to 34, characterised in that the coupling lock comprises at least one handle (80) on the outer side of at least two, in particular opposite, frame bands (52, 54), in particular in the area of or below the junction between the outer side and the upper side (60, 62) of a frame band (52, 54).
36. A multiple coupling lock according to claim 35, characterised in that the handle (80) comprises at least one handle bar (96) attached to the outer side of a frame band (52, 54), containing at least one second clamping opening (82), at least one first handle element (90), in particular a first handle plate, at least

one second handle element (92), in particular at least a second handle plate, and at least one first and at least one second hinge (86, 88), in particular a film hinge, the first handle element (90) being connected with the handle bar (96) via the first film hinge (86), and the second handle element (92) being connected with the first handle element (90) via the second film hinge (88), and the second handle element (92), in particular in area around the edge, having at least one second clamping element (94), which corresponds to the second clamping opening (82), and it being possible to fold the second handle element (92) onto the first handle element (90), and to latch the second clamping element (94) into the second clamping opening (82), in particular in a reversible manner.

37. A multiple coupling lock according to one of claims 11 to 37, characterised in that at least one join (56), in particular with two opposite or not directly adjacent joins, adjacent frame bands (52, 54) and/or their extension in the join form, at least in sections, an angle, at least in the profile in the join (56), in particular an acute or right angle.
38. A multiple coupling lock according to one of claims 11 to 37, characterised in that the coupling lock comprises at least one notch (57), in particular one which is essentially parallel to the rotational axis of the join, is positioned at least along a section of the inner side of at least one join (56), in particular on the inner sides of opposite joins.
39. A multiple coupling lock according to one of the above claims, characterised in that the second coupling lock (110, 110') comprises a closing flap with a first pipe connection, it being possible to bring the closing flap to a closed position, in which the first end of the pipe connection can be locked in a particularly atmospherically sealed manner.
40. A multiple coupling lock according to one of the above claims, characterised by at least one, in particular reversible and/or environmentally sealed connection unit (116), in particular a triclamp connection, on at least one coupling lock or a basic body (112, 112'), or container (114, 114'), which is connected to a coupling lock (101, 101': 110, 110'), with which the first or second means of conveyance (102, 102') can be or is connected, either indirectly or directly, in particular in an environmentally sealed manner, with a

coupling lock or the basic body or container which is connected to said coupling lock.

41. A multiple coupling lock according to one of the above claims, characterised in that the first and/or the second means of conveyance (102, 102') and the connection unit (116) comprise a coupling lock (101, 101'; 110, 110') according to a first embodiment, for the essentially environmentally sealed, reversible locking and for the essentially environmentally sealed filling and/or refilling of bulk materials, in particular flexible containers or hose elements, comprising at least one flexible band (2) with at least one first, in particular continuous, locking element (10), in particular a spring, on its inner side (6) and at least one second flexible band (4) with at least one second, in particular continuous locking element (12) on its inner side (8), which is complementary to the first locking element (10), and which enables a reversible, tight lock with said locking element, in particular a groove, the first and second band (2, 4) and/or the first and second locking element (10, 12) in particular are essentially of the same length, whereby the first and second band (2, 4), in particular via each of their end sections, are connected with each other, in particular to form a closed circumference, and whereby the upper side (14) of the first band (2) comprises at least a third, in particular continuous, locking element (18) and/or the upper side (16) of the second band (4) comprises or comprise at least one fourth, in particular continuous, locking element (20), and/or a coupling lock (101, 101'; 110, 110') according to a second embodiment, for the essentially environmentally sealed, reversible locking and/or for the essentially environmentally sealed filling and/or refilling of bulk materials, in particular flexible containers, hoses or hose elements, in particular essentially rigid frame bands (52, 54) and join elements (56), whereby immediately adjacent frame bands each are connected via at least one join element between these frame bands to form an encompassing folding frame, so that the inner sides (60, 62) of adjacent and/or opposite frame bands can be folded one on top of the other to form a lock, which is in particular environmentally sealed, so that an environmentally sealed attachment of the first or second means of conveyance can be created to form a docking device for the in particular environmentally sealed filling and/or

refilling of bulk materials, comprising a first and a second coupling lock according to the first embodiment, the first and second band (2, 4) of the first coupling lock (1) and the first and second band (2', 4') of the second coupling lock (1') are in particular essentially of the same length, and whereby the third and fourth locking elements (18, 20) of the upper sides (14, 16) of the first and second band (2, 4) of the first coupling lock (1) are complementary to the third and fourth locking elements (20', 18) of the upper sides (14', 16') of the first and second band (2', 4') of the second coupling lock (1'), so that the first and second bands (2, 2', 4, 4') of the first and second coupling lock (1, 1') can be connected with each other, in particular in a reversible and environmentally sealed manner, and/or can be reversibly connected to form a docking device for the in particular environmentally sealed filling and/or refilling of bulk materials, comprising a first and a second coupling lock (50, 50') according to the second embodiment, whereby the first and second coupling locks essentially correspond in terms of number, length and the arrangement of their frame bands (52, 54; 52', 54'), so that first and second folding frames (58, 58') result which can be connected with each other, and whereby the first locking element (72) of the upper side of the frame bands (52, 54) of the first coupling lock (50) is complementary to the first locking element (72') of the upper side of the frame bands (52', 54') of the second coupling lock (50'), so that first and second coupling locks can be connected in a reversible, in particular environmentally sealed, manner.

42. A multiple docking device (130) in particular a double docking device, in particular for the environmentally sealed filling and/or refilling of bulk materials, comprising a first and a second multiple coupling lock (120, 120') according to the invention, it being possible to couple the first coupling locks (101, 101') of the first and second multiple coupling lock (120, 120') with each other to form a first, in particular environmentally sealed, docking device (104), and whereby the adjacent second coupling locks (110, 110') from the first and second multiple coupling lock (120, 120') can be coupled with each other to form a second docking device.
43. A multiple docking device (130) in particular for the environmentally sealed filling and refilling of bulk materials, comprising a multiple coupling lock according to one of claims 1 to 35 and a coupling lock which can be coupled

to the second coupling lock of the multiple coupling lock to form a docking device, which is in particular environmentally sealed, and on which at least one connection unit (116) is fitted, which can be docked to the first coupling lock (101, 101') of the multiple coupling lock, in particular in an environmentally sealed manner.

44. A multiple docking device (130) according to claim 43, characterised in that the first coupling locks (101, 101') of the first and second multiple coupling lock (120, 120') or the first coupling locks of the first or second multiple coupling lock with the connection unit (116) comprise a docking device in particular for the environmentally sealed filling and/or refilling of bulk materials, comprising a first and a second coupling lock (1, 1') according to the first embodiment, comprising at least one flexible band (2) with at least one, in particular continuous locking element (10), in particular a clip, on its inner side (6) and at least one second flexible band (4) with at least a second, in particular continuous locking element (12) on its inner side (8), which is complementary to the first locking element (10), and which makes it possible to create a reversible, tight lock with this element, in particular a groove, whereby the first and second band (2, 4) and/or the first and second locking element (10, 12) in particular are essentially of the same length, whereby the first and second band (2, 4) in particular via each of their end sections are connected with each other, in particular to form a closed circumference, and whereby the upper side (14) of the first band (2) comprises or comprise at least a third, in particular continuous locking element (18) and/or the upper side (16) of the second band (4) comprises or comprise at least one fourth, in particular continuous locking element (20), whereby the first and second band (2, 4) of the first coupling lock (1) and the first and second band (2', 4') of the second coupling lock (1') are in particular essentially of the same length, and whereby the third and fourth locking elements (18, 20) on the upper sides (14, 16) of the first and second band (2, 4) of the first coupling lock are complementary to the third and fourth locking elements (20', 18') of the upper sides (14', 16') of the first and second band (2', 4') of the second coupling lock (1'), so that the first and second bands (2, 2', 4, 4') of the first and second coupling lock (1, 1') can be connected with each other in a reversible, and in particular environmentally sealed manner, or form a docking device in particular for the

environmentally sealed filling and/or refilling of bulk materials, comprising a first and a second coupling lock (50, 50') according to the second embodiment, comprising in particular essentially rigid frame band (52, 54) and join elements (56), whereby immediately adjacent frame bands are in each case connected with each other via at least one join element between these frame bands to form an encompassing folding frame (58), so that the inner sides (60, 62) of adjacent and/or opposite frame bands can be folded one on top of the other to form an in particular environmentally sealed lock, whereby the first and second coupling locks are essentially identical in terms of their number, length and the arrangement of their frame bands (52, 54; 52', 54'), so that first and second folding frames (58, 58') result, which can be connected with each other, and whereby the first locking element (72) of the upper side of the frame bands (52, 54) of the first coupling lock (50) is complementary to the first locking element (72') of the upper side of the frame bands (52', 54') of the second coupling lock (50'), so that the first and second coupling locks can be connected in particular in an environmentally sealed, reversible manner.

45. A multiple docking device according to claim 44 is characterised in that the docking device comprises at least a fifth and/or sixth locking element on at least one outer side of the first and/or second band of the first and/or second coupling lock, which is or are complementary to the seventh and/or eighth locking elements of the locking lid(s) of the first and/or the second coupling lock.
46. A multiple docking device according to claim 45, characterised in that the locking lid (30) of the first coupling lock (1) be reversibly connectable or connected with at least a seventh and/or eighth locking element (24') of the second coupling lock (1'), and that the locking lid (30') of the second coupling lock (1') be reversibly connectable or connected with at least a seventh and/or eighth locking element (24) of the first coupling lock (1), when the third and fourth locking elements (18, 18', 20, 20') from the first and second coupling lock (1, 1') are connected with each other.
47. A multiple docking device according to one of claims 44 to 46, characterised in that the first and/or second coupling lock (1, 1') is or can be connected to a flexible container (38, 40) or a flexible hose or hose element

48. A multiple docking device according to one of claims 44 to 47, characterised in that the first and second coupling lock (1, 1') are essentially identical.
49. A multiple docking device according to claim 44 is characterised in that the docking device comprises at least one second locking element (74, 74') on the outer side of at least one frame band (52, 54; 52', 54') of the first and/or the second coupling lock (50, 50'), which is complementary to the fourth locking element or the second clamping element (94) of the locking lid (80).
50. A multiple docking device according to claim 44 or 49, characterised in that the docking device comprises a flexible container and/or a hose or hose element, which is essentially connected with the first and/or second coupling lock (50, 50') in an environmentally sealed manner.
51. A multiple docking device (130) according to one of claims 42 to 50, characterised in that the second coupling locks (110, 110') from the first and second multiple coupling lock (120, 120') create a unit for coupling two means of storage and/or means of conveyance for the purpose of transferring bulk materials from a first means of storage and/or means of conveyance with a closing flap in a first pipe connection at a first end and in interaction with at least one shaft into a second means of storage and/or means of conveyance with a second closing flap in a second pipe connection at a second end and in interaction with at least one shaft, whereby the closing flap from a closed position, in which the first closing flap locks the first means of storage and/or means of conveyance at a first end in particular in an atmospherically sealed manner, the second flap locks the second means of storage and/or means of conveyance in an atmospherically sealed manner, and the two closing flaps and/or the two pipe connections can be moved relative to each other.
52. A multiple docking device according to one of claims 42 to 51, characterised by at least one suction device and/or at least one rinsing device in interaction with the first or second docking device and/or at least one means of conveyance.
53. A container, in particular a flexible container, comprising a multiple coupling lock according to one of claims 1 to 41, whereby the second coupling lock on the outlet opening of the multiple coupling lock can be or is connected directly with the container, or via a flexible hose element, or is an integral component of said container.

54. A means of conveyance, in particular a hose, comprising at least one multiple coupling lock according to claims 1 to 41, the means of conveyance, in particular an opening edge area of the means of conveyance, being indirectly or directly connected, or connectable, to a second, or inner, coupling lock of the multiple coupling lock.

55. A procedure in particular for the environmentally sealed filling, refilling and/or emptying of flexible containers, characterised in that

- a) a first container according to claim 53, or a means of conveyance according to claim 54, is connected with a stationary or transportable second container according to claim 53 or a means of conveyance according to claim 54 in each case via the first coupling lock on the first and second multiple coupling lock to form a docking device in an open or in particular a closed state
- b) the docking device is opened from the first coupling locks on the first and second multiple coupling lock, while retaining a docking device which is environmentally sealed
- c) the second coupling locks on the first and second multiple coupling locks are connected with each other using the opening of the first docking device and forming a second, in particular environmentally sealed, docking device
- d) the second coupling locks on the first and second multiple coupling lock are opened while retaining a second docking device, in particular an environmentally sealed docking device
- e) the bulk materials are transferred from the first into the second container, or vice-versa, or through the means of conveyance into the first or second container, or vice-versa
- f) the second coupling locks on the first and second multiple coupling lock are locked, in particular in an environmentally sealed manner, while retaining a docking device, in particular an environmentally sealed docking device
- g) the second coupling locks on the first and second multiple coupling lock are separated from each other when decoupling the second docking device, in particular in an environmentally sealed manner

- h) the first coupling locks on the first and second multiple coupling lock are locked in particular in an environmentally sealed manner, while retaining a docking device, in particular an environmentally sealed docking device, and
- i) the first coupling locks on the first and second multiple coupling lock are separated from each other when decoupling the first docking device, in particular in an environmentally sealed manner.

56. A procedure according to claim 55, characterised in that subsequent to stage h), the inner area formed by the first and second means of conveyance, i.e. the means of conveyance from the first and second multiple coupling lock, and from the first docking device, is assigned at least one suction device with a vacuum.
57. A procedure according to claim 55 or 56, characterised in that subsequent to stage g), the inner area, in each case formed by the first and second means of conveyance between the closed first and second coupling locks of the first and second multiple coupling lock, is equipped with at least one suction device with one vacuum.
58. A procedure according to one of claims 55 to 57, characterised in that subsequent to stage h) and/or stage g), the inner area between the second, or inner, coupling locks on the first and second multiple coupling lock and/or the inner areas between the first and second coupling locks on the first and second multiple coupling lock and/or following stage f) and/or stage h), the docking device/devices are rinsed with a cleaning fluid.
59. A use of multiple coupling locks according to one of claims 1 to 41 for the environmentally sealed filling, refilling or emptying of in particular flexible containers.